CLAIMS:

1. A multiple component adhesive composition comprised of a polymeric reinforcing phase component and an adsorbent phase component, both as heterogeneously dispersed particulates within a liquid component, wherein the reinforcing phase component is substantially incompatible with the liquid component, the adsorbent phase component is compatible or substantially more compatible with the liquid component than is the reinforcing phase component, and the reinforcing phase and adsorbent phase components are partially compatible with one another, the composition having the rheological characteristics of a liquid dispersion and being capable of forming a molten blend at elevated temperatures that solidifies into a solid adhesive upon cooling.

2. The adhesive composition of claim 1 wherein the dispersed particulates are comprised of a mixture of separate and chemically discrete particulate types, at least one of the particulate types being comprised of substantially the same matter as that which comprises the reinforcing phase component in the fused, solid adhesive, and at least one of the particulate types being comprised of substantially the same matter as that which comprises the adsorbent phase component in the fused, solid adhesive.

3. The adhesive composition of claim 1 wherein the dispersed particulates are comprised of a core surrounded by a shell, the core being comprised of substantially the same matter as that which comprises the reinforcing phase component in the fused, solid adhesive, and the shell being comprised of substantially the same matter as that which comprises the adsorbent phase component in the fused, solid adhesive.

4. The adhesive composition of claim 1 wherein the dispersed particulates are resistant to the liquid component adsorption at temperatures below 150°F.

5. The adhesive composition of claim 1 wherein the liquid component is comprised of a chemically non-reactive liquid compound, a chemically reactive liquid

compound, or a mixture thereof; the reinforcing phase component is comprised of one or more polyolefin homopolymers, polyolefin copolymers, or mixtures thereof; and the adsorbent phase component is comprised of a polyolefin homopolymer, a polyolefin copolymer, a mono carboxylic acid compound, a dicarboxylic acid compound, a tricarboxylic acid compound, or mixtures thereof.

6. The adhesive composition of claim1 where the ratio of the reinforcing phase component to the adsorbent phase component is greater than unity.

7. The adhesive composition of claim 1 which is further comprised of one or more additional components selected from the group consisting of a thermal stabilizer, a tackifier resin, micron sized inorganic particulates, nanometer sized inorganic particulates, pigments, a thermal initiator, a blowing agent, a photoinitiator, or any other reaction catalyst, and where said one or more additional components are either dispersed or dissolved in the liquid component of the adhesive composition.

8. The adhesive composition of claim 1 wherein the adhesive in its solid form is a thermoplastic or thermoset.

9. The adhesive composition of claim 1 where the reinforcing phase component is comprised of either one or more in combination of a poly(ethylene-co-vinylacetate) copolymer, a poly(ethylene-co-methacrylic acid) copolymer, a poly(ethylene-co-maleic anhydride) block or graft copolymer, a poly(ethylene-co-vinyl acetate-co-acrylic acid) terpolymer, a poly(ethylene-co-vinyl acetate-co-methacrylic acid) terpolymer, a poly(ethylene-co-vinyl acetate-co-maleic anhydride) block or graft terpolymer, or mixtures thereof.

10. The adhesive composition of claim 1 where the reinforcing phase component is comprised of either one or more in combination of a poly(ethylene-co-vinylacetate) copolymer having a VA level of greater than 1% but less than 18%, a poly(ethylene-co-vinyl

acetate-co-acrylic acid) terpolymer having a VA level of greater than 1% but less than 18% and an acrylic acid level of less than 8%, a poly(ethylene-co-vinyl acetate-co-methacrylic acid) terpolymer having a VA level of greater than 1% but less than 18% and a methacrylic acid level of less than 8%, a poly(ethylene-co-vinyl acetate-co-maleic anhydride) block or graft terpolymer having a VA level of greater than 1% but less than 18% and a maleic anhydride level of less than 8%, or mixtures thereof.

11. The adhesive composition of claim 1 wherein the reinforcing phase component forms a core of a core-shell particle and is comprised of either one or more in combination of a poly(ethylene-co-vinylacetate) copolymer having a VA level of greater than 1% but less than 50%, a poly(ethylene-co-vinyl acetate-co-acrylic acid) terpolymer having a VA level of greater than 1% but less than 50% and an acrylic acid level of less than 8%, a poly(ethylene-co-vinyl acetate-co-methacrylic acid) terpolymer having a VA level of greater than 1% but less than 50% and a methacrylic acid level of less than 8%, a poly(ethylene-co-vinyl acetate-co-maleic anhydride) block or graft terpolymer having a VA level of greater than 1% but less than 50% and a maleic anhydride level of less than 8%, or mixtures thereof.

12. The adhesive composition of claim 1 where the adsorbent phase component is comprised of either one or more in combination of a polypropylene homopolymer, a polypropylene copolymer, a poly(propylene-co-ethylene) copolymer, a poly(propylene-co-maleic anhydride) block or graft copolymer, a polyethylene polymer, stearic acid, palmitic acid, lauric acid, benzoic acid, sebacic acid, dodecanedioic acid, azelaic acid, adipic acid, phthalic acid, a pentaerythritol rosin ester, a terpene resin, a glycerol rosin ester, a polycaprolactone, a hydrocarbon wax, or mixtures thereof.

13. The adhesive composition of claim 1 where the adsorbent phase component forms a shell of a core-shell particle and is comprised of either one or more in combination of a polypropylene homopolymer, a polypropylene copolymer, a poly(propylene-co-ethylene) copolymer, a poly(propylene-co-maleic anhydride) block or graft copolymer, a

polyethylene polymer, stearic acid, palmitic acid, lauric acid, benzoic acid, sebacic acid, dodecanedioic acid, azelaic acid, adipic acid, phthalic acid, a pentaerythritol rosin ester, a terpene resin, a glycerol rosin ester, a polycaprolactone, a hydrocarbon wax, or mixtures thereof.

14. The adhesive composition of claim 1 where the liquid phase component is comprised of one or more liquids, alone or in combination, selected from the group consisting of mineral oil, a vegetable oil such as soy or epoxidized soy oil, oleic acid or its esters, isostearic acid and its esters, lactic acid and its esters, esters of dicarboxylic acids such as dibutlyphthalate, dioctylphthalate, diisononylphthalate, dioctyladipate, and dioctylsebacate, a reactive acrylic monomer or oligomer, a reactive epoxy monomer or oligomer, a reactive mono or diamine, and mixtures thereof.

15. The adhesive composition of claim 1 where the adsorbent phase component is comprised of either a poly(propylene-co-maleic anhydride) copolymer, a polyethylene homopolymer, a polypropylene homopolymer, a polycaprolactone polymer, a tricarboxylic acid compound, dicarboxylic acid compound, a monocarboxylic acid compound, a rosin ester, a hydrocarbon resin, or a mixture thereof; where the reinforcing phase component is comprised of either a poly(ethylene-co-vinyl acetate) copolymer, a poly(ethylene-co-vinyl acetate-co-methacrylic acid) terpolymer, a poly(ethylene-co-vinyl acetate-co-acrylic acid) terpolymer, a poly(ethylene-co-vinyl acetate-co-maleic anhydride) terpolymer, or a mixture thereof; where the liquid phase component is comprised of either mineral oil, a vegetable oil, an ester of a dicarboxylic acid, an ester of a monocarboxylic acid, or a mixture thereof; wherein said composition is further comprised of either tackifier resins, thermal stabilizers, micron sized or nanometer sized inorganic particulates such as calcium carbonate, talc, aluminum oxide and its hydrates, aluminum silicates, magnesium silicates, montmorillonite, titanium dioxide, zinc oxide, iron oxide, a foaming agent, or mixtures thereof; wherein the ratio of the reinforcing phase and adsorbent phase components is greater than unity; and where the ratio of the liquid phase component to the sum of all other components is

sufficient so as to enable the composition to exist as a liquid dispersion under ambient conditions.

16. The adhesive composition of claim 1, further comprised of exfoliated nanoparticles.

17. The adhesive composition of claim 16 wherein said nanoparticles are surface treated.

18. The adhesive composition of claim 1, further comprised of aggregated or partially exfoliated nanoparticles.

19. The adhesive composition of claim 1 where the adsorbent phase component is comprised of a compound that imparts release characteristics to a finished article formed from the composition.

20. The adhesive composition of claim 19 where the adsorbent phase component is comprised of N,N'-ethylenebisstearamide.

21. The adhesive composition of claim 12 where the adsorbent phase component is comprised of maleated polypropylene.

22. A multiple component adhesive composition comprised of heterogeneously dispersed particulates within a liquid phase component, where said composition has the rheological characteristics of a liquid dispersion, and where said composition can be fused at elevated temperatures to form a molten blend that solidifies into a solid adhesive upon cooling; wherein said adhesive is comprised of a poly(ethylene-co-vinyl acetate) reinforcing phase component; a poly(propylene-co-maleic anhydride) adsorbent phase component; a mineral oil liquid phase component; a thermal stabilizer; and a dicarboxylic acid compound.

23. The adhesive composition of claim 22 where the adsorbent phase is further comprised of polypropylene.

24. The adhesive composition of claim 22, wherein the dicarboxylic acid compound is comprised of sebacic or dodecanedioic acid.

25. The adhesive composition of claim 22, wherein the dicarboxylic acid compound is dispersed or dissolved in the liquid phase of the liquid dispersion.

26. The adhesive composition of claim 22 further comprised of at least partially exfoliated nanoparticles.

27. The adhesive composition of claim 22 further comprised of a chemical foaming agent.

28. The adhesive composition of claim 22 wherein the dispersed particulates are comprised of a mixture of separate and chemically discrete particulate types; where at least one of the particulate types is comprised of substantially the same matter as that which comprises the reinforcing phase component in the fused, solid adhesive; and where at least one of the particulate types is comprised of substantially the same matter as that which comprises the adsorbent phase component in the fused, solid adhesive.

29. A method of blending the components of the compositions in claim 1, where said components are first mixed to form a liquid dispersion, said liquid dispersion is then fused, molten, and shear mixed to produce a homogeneous melt-blend; and where said melt-blend is subsequently dispensed onto a substrate that is lower in temperature than the melt-blend, so that the melt blend cools to form a solid adhesive on said substrate.

30. A method of preparing the liquid dispersion of the composition of claim 16, comprising adding nanoparticles to a liquid component to form a liquid dispersion, and

subjecting the liquid dispersion to mixing, either mechanical, ultrasound, or both, to achieve substantial exfoliation of the nanoparticles in the liquid dispersion.

31. A method of preparing the liquid dispersion of claim 18 wherein said nanoparticles are added directly to the liquid component, or are added from a pre-concentrated liquid dispersion, wherein said nanoparticles remain substantially aggregated in the final liquid dispersion.

32. A method of blending the components of the adhesive composition in claim 1, wherein the said adhesive compositions are additionally comprised of nanometer sized particulates; comprising pre-shear blending the nanometer sized particulates into a pre-weighed fraction of the liquid phase component of the adhesive composition to form a liquid concentrate of exfoliated nanoparticles; wherein said liquid concentrate is then mixed with the remainder of the liquid phase component, and with the other ingredients of the adhesive composition to form a liquid dispersion; and where said liquid dispersion is then fused, molten, and shear mixed to produce a homogeneous melt-blend comprised of substantially exfoliated nanoparticles; after which said melt-blend is subsequently dispensed onto a substrate that is lower in temperature than the melt-blend, so that the melt-blend cools on said substrate to form a solid adhesive comprised of substantially exfoliated nanoparticles.

33. A method of blending the components of the adhesive composition in claim 1, wherein the said adhesive compositions are additionally comprised of nanometer sized particulates; utilizing a process to either directly add nanoparticle aggregates, or to pre-blend the nanoparticle aggregates into a pre-weighed fraction of the liquid phase component of the adhesive composition to form a liquid concentrate of substantially aggregated nanoparticles; wherein said liquid concentrate is then mixed with the remainder of the liquid phase component, and with the other ingredients of the adhesive composition to form a liquid dispersion comprised of substantially aggregated nanoparticles; and where said liquid dispersion is then fused, molten, and shear mixed to produce a homogeneous melt-blend comprised of substantially exfoliated nanoparticles; after which said melt-blend is

subsequently dispensed onto a substrate that is lower in temperature than the melt-blend, so that the melt blend cools on said substrate to form a solid adhesive comprised of substantially exfoliated nanoparticles.

34. A hot-melt adhesive composition comprised of at least partially exfoliated nanoparticles.

35. A hot-melt adhesive composition comprised of substantially aggregated nanoparticles.

36. A method of processing a hot-melt adhesive composition comprised of substantially aggregated nanoparticles; wherein said composition is molten, and shear mixed to produce a homogeneous melt-dispersion comprised of at least partially exfoliated nanoparticles; and where said melt-dispersion is subsequently dispensed onto a substrate that is lower in temperature than the melt-dispersion, so that the melt-dispersion cools to form a solid adhesive on said substrate, wherein the solid adhesive is comprised of substantially exfoliated nanoparticles.

37. A multiple component composition comprised of heterogeneously dispersed particulates within a liquid phase component, where said composition has the rheological characteristics of a liquid dispersion, wherein said composition can be fused at elevated temperatures and then solidified into a solid plastic material upon cooling; wherein said plastic material composition comprises a polymeric reinforcing phase component, an adsorbent phase component, and an adsorbed liquid component; such that the reinforcing phase component is substantially incompatible with the liquid component of the plastic material composition, and the reinforcing phase and adsorbent phase components are partially compatible with one another.

38. The multiple component composition of claim 37, wherein the dispersed particulates are comprised of a mixture of separate and chemically discrete particulate types,

at least one of which is comprised of substantially the same matter as that which comprises the reinforcing phase component in the fused solid plastic, and wherein at least one of the particulate types is comprised of substantially the same matter as that which comprises the adsorbent phase component in the fused plastic or coating.

39. The adhesive composition of claim 1, further comprised of a chemical blowing agent.

40. A method of processing the adhesive composition of claim 39 whereby the composition is pumped through a hydraulically sealed heater under a pressure of at least 250 psi to melt the composition and to maintain dissolution of the gas during dynamic or static mixing of the molten material under pressure; and whereby the melt composition is subsequently dispensed to atmospheric pressure so as to produce a foam which solidifies into a closed cell solid, or into partially closed-cell solid structure upon cooling.

41. A method of processing the composition of claim 37, comprising adding substantially aggregated nanoparticles to the composition while a liquid and then shear mixing the liquid containing the nanoparticles to at least partially exfoliate the nanoparticles.

42. The method of claim 41 wherein the liquid composition containing the nanoparticles is heated before and/or during the shear mixing.

43. The method of claim 42 wherein the liquid composition containing the nanoparticles mixture is pumped through a heated mixer.

44. The composition of claim 37 utilized in forming flexible plastics, rigid plastics, structural plastics, caulks, sealants, adhesives or coatings.

45. The composition of claim 37, further comprising exfoliated nanoparticles.

46. The composition of claim 37, further comprising aggregated or partially exfoliated nanoparticles.